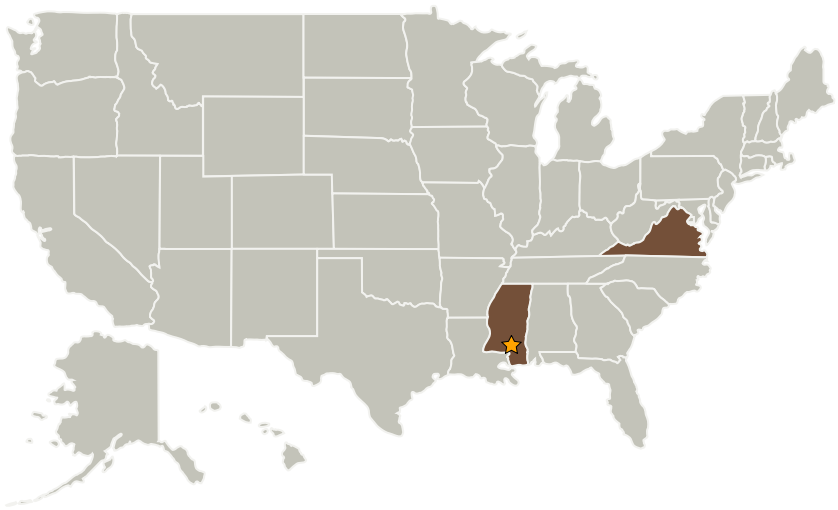
Virtual Sensor Test Instrumentation, Phase I

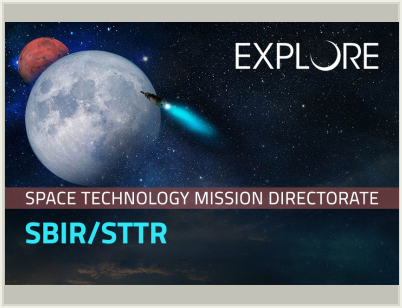
Completed Technology Project (2006 - 2006)

Project Introduction

Smart sensor combining with embedded metadata and wireless technology presents real opportunities for significant improvements in reliability, cost-benefits, and safety for remote testing and measurement. Adding robust and self-construct network protocol for routing will further simplify testing installation process and increase test network reliability. The realization of a practical smart sensor system requires the synthesis of several technologies. One must bring together knowledge in the fields of sensors, data processing, distributed systems, and networks. The IEEE 1451 standard provides a basic communications link for sensor nodes, but provides no methods specific to programming a node's data processing resources. An interface must be defined for dynamic programming of sensor nodes. Mobitrum is proposing a virtual sensor test instrumentation for characterization and measurement of ground testing of propulsion systems. The tool includes: (1) common sensor interface, (2) microprocessor, (3) wireless interface, (4) signal conditioning and ADC/DAC, and (5) on-board EEPROM for metadata storage and executable software to create powerful, scalable, re-configurable, and reliable embedded and distributed test instrument. Virtual sensor is built upon an open-system architecture with standardized protocol modules/stacks easily to interface with industry standards and commonly used software such as IEEE 1451, TEDS, Java, TinyOS, TinyDB, MATLAB, and LabVIEW.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Stennis Space Center (SSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Stennis Space Center(SSC)	Lead Organization	NASA Center	Stennis Space Center, Mississippi
Mobitrum Corporation	Supporting Organization	Industry	McLean, Virginia

Primary U.S. Work Locations	
Mississippi	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
  - TX13.2 Test and Qualification
    - TX13.2.7 Test Instruments and Sensors